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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,556	04/12/2004	Masashi Enomoto	S1459.70088US00	2616

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EXAMINER	
HALL, ASHA J	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
02/13/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/822,556	ENOMOTO ET AL.	
	Examiner	Art Unit	
	ASHA HALL	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *April 12, 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :September 23, 2004 and July 24, 2006.

DETAILED ACTION

Information Disclosure Statement

1. On the information disclosure statement filed on September 2, 2004, the NPL documents which are lined through fail to comply with the provisions of 37 DFR 1.97, 1.98 and MPEP§ 609, because cited references must be published documents available to the public. Email correspondence does not meet the criteria. It has been place in the application file, but the information referred to therein has not been considered as to the merits. See MPEP§ 609.05(a).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 7, and 22-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 7, and 22-26 are rendered indefinite because it is unclear that the "fine particles" referred to in this claim is within a particular range of the size of the particles. The Examiner as interpreted the "fine particles" to refer to 100 nm or less in size.

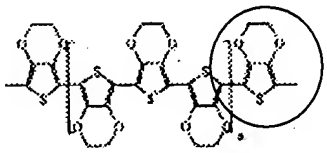
Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

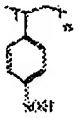
> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6 and 9-17 are rejected under 35 U.S.C. 102(b) as being anticipate by Meinhardt et al. "Optoelectronic Device made from Multilayer and Molecularly Doped Organic Layers," SPIE Conference on Organic Photonic Materials and Devices Vol. 3623, January 1999, pp. 46-57).

With respect to claims 1-2, Meinhardt et al. discloses the fabrication method of a photoelectric conversion device (paragraph 2, page 47) comprising a semiconductor electrode/ITO and a metal film/Al to be an opposite electrode formed on a metal oxide film/organic layer 1 (TiO-Pc layer) as shown in Figure 2 (paragraph 5, page 48), wherein the method includes steps of forming an intermediate film comprising a compound selected from polythiophene / PEDOT defined by the following Formula 1 as well as polystyrenesulfonic acid defined by the following Formula 2, on the metal oxide film/ TiO-Pc and forming the metal film/Al on the intermediate film/PEDOT-PSS (section 3.1 (b) on page 50) as shown in Figure 1.



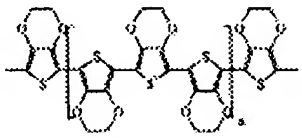
Formula 1



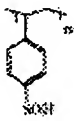
Formula 2

In regard to claim 3, Meinhardt discloses the fabrication method of a photoelectric conversion device as claimed in claim 1, wherein the intermediate film is formed by using an aqueous solution containing polyethylene dioxythiophene/PEDOT doped with PSS (paragraph 2, page 48: Meinhardt makes referency to the supplier Baytron® formerly owned by Bayer®, which is also well know in the art that PEDOT-

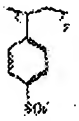
PSS is commerically available in an aqueous suspension as evidence given by Starck GmbH http://server2.idtechex.com/products/en/presentation.asp?presentationid=646 accessed 1/31/2008) defined by the following Formula 1, polystyrenesulfonic acid ion defined by the following Formula 2, and polystyrenesulfonic acid defined by the following also Formula 3 as shown in Figure 1.



Formula 1



Formula 2



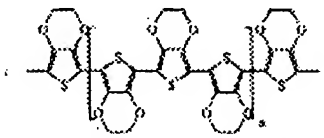
Formula 3

In regard to claim 4, Meinhardt discloses the fabrication method of a photoelectric conversion device as claimed in claim 1, wherein metal oxide film is made of one metal oxide selected from TiO_2 (paragraph 1 of section 2.3, page 49).

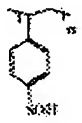
As to claims 5 and 6, Meinhardt discloses the fabrication method of a photoelectric conversion device as claimed in claim 1, wherein the metal film is a monolayer made of aluminum (paragraph 2, page 49).

With respect to claims 9-10, Meinhardt et al. discloses a photoelectric conversion device (paragraph 2, page 47) and the manufacturing of a photoelectric conversion device comprising a metal film/Al to be formed on a metal oxide film/organic layer 1 (TiO-Pc layer) as shown in Figure 2 (paragraph 5, page 48), wherein the method

includes steps of forming an intermediate film comprising a compound selected from polythiophene / PEDOT defined by the following Formula 1 as well as polystyrenesulfonic acid defined by the following Formula 2, on the metal oxide film/ TiO-Pc and forming the metal film/Al on the intermediate film/PEDOT-PSS (section 3.1 (b) on page 50) as shown in Figure 1.



Formula 1



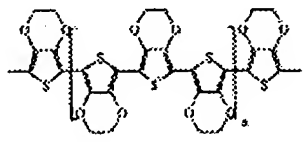
Formula 2

With respect to claim 11, Meinhardt et al. discloses an electronic apparatus/ photoelectric conversion device (paragraph 2, page 47) a metal film/Al to be formed on a metal oxide film/organic layer 1 (TiO-Pc layer) as shown in Figure 2 (paragraph 5, page 48), wherein the method includes steps of forming an intermediate film comprising a compound selected from polythiophene / PEDOT defined by the following Formula 1 as well as polystyrenesulfonic acid defined by the following Formula 2, on the metal oxide film/ TiO-Pc and forming the metal film/Al on the intermediate film/PEDOT-PSS (section 3.1 (b) on page 50) as shown in Figure 1.

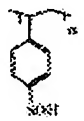
As to claims 12 and 13, Meinhardt et al. discloses a metal film formation method for forming a metal film on a metal oxide film and a layer structure comprising a metal film formedon a metal oxide film as shown in Figure 2 (paragraph 5, page 48 & section 2.3 paragraph 2, page 49), wherein the method includes steps of forming an intermediate film comprising at least one compound selected from polythiophene

defined by the following Formula 1 as well as polystyrenesulfonic acid defined by the following Formula 2 (as shown above), on the metal oxide film and forming the metal film on the intermediate film (section 3.1 (b) on page 50).

With respect to claims 14 and 15, Meinhardt et al. discloses the fabrication method of a photoelectric conversion device (paragraph 2, page 47) comprising a semiconductor electrode/ITO and a metal film/Al to be an opposite electrode formed on a metal oxide film/organic layer 1 (TiO-Pc layer) as shown in Figure 2 (paragraph 5, page 48), wherein the method includes steps of forming an intermediate film comprising a compound selected from polythiophene / PEDOT defined by the following Formula 1 as well as polystyrenesulfonic acid defined by the following Formula 2, on the metal oxide film/ TiO-Pc and forming the semiconductor electrode/ITO on the intermediate film/PEDOT-PSS as shown in Figure 2.



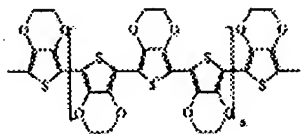
Formula 1



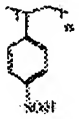
Formula 2

In regard to claim 16, Meinhardt discloses the fabrication method of a photoelectric conversion device as claimed in claim 14, wherein the intermediate film is formed by using an aqueous solution containing polyethylene dioxythiophene/PEDOT doped with PSS (paragraph 2, page 48: Meinhardt makes referency to the supplier Baytron® formerly owned by Bayer®, which is also well know in the art that PEDOT-PSS is commerically available in an aqueous suspension as evidence given by Starck

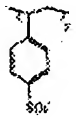
GmbH http://server2.idtechex.com/products/en/presentation.asp?presentationid=646 accessed 1/31/2008) defined by the following Formula 1, polystyrenesulfonic acid ion defined by the following Formula 2, and polystyrenesulfonic acid defined by the following also Formula 3 as shown in Figure 1.



Formula 1



Formula 2



Formula 3

In regard to claim 17, Meinhardt discloses the fabrication method of a photoelectric conversion device as claimed in claim 14, wherein metal oxide film is made of one metal oxide selected from TiO_2 (paragraph 1 of section 2.3, page 49).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meinhardt et al. "Optoelectronic Device made from Multilayer and Molecularly Doped Organic

Layers," SPIE Conference on Organic Photonic Materials and Devices Vol. 3623, January 1999, pp. 46-57) as applied to claim 1 above, and in further view of Takahashi et al. (US 6,261,684).

In regard to claim 7, Meinhardt discloses the fabrication method of a photoelectric conversion device as claimed in claim 1, but fails to disclose wherein the semiconductor electrode is composed of semiconductor fine particles.

Takahashi et al. discloses the semiconductor device to control the effects of solar radiation and further discloses the use of ITO powder composed of the average particle size of 100 nm or less (col. 3; lines:35-46). Takahashi further teaches that the transparency and uniformity of the infrared ray blocking layer depends on the average particle size of the ITO powder such that a clear view and electromagnetic wave transmission are obtained (col. 3; lines: 35-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate nano-sized ITO particles as taught by Takahashi et al. to the fabrication method of a photoelectric conversion device of Meinhardt in order to receive a clear view and electromagnetic wave transmission.

8. Claims 8, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meinhardt et al. "Optoelectronic Device made from Multilayer and Molecularly Doped Organic Layers," SPIE Conference on Organic Photonic Materials and Devices Vol. 3623, January 1999, pp. 46-57) as applied to the above claims 1 and 14 respectively, and in further view of Kawakami (US 5,320,723).

As to claims 8, 19, and 21, Meinhardt discloses the fabrication method of a photoelectric conversion device as claimed in claims 1 and 14 above, but fails to disclose wherein the photoelectric conversion device is a wet type solar cell and the semiconductor electrode is formed by using a strongly acidic semiconductor fine particle dispersion .

Kawakami et al. disclose a photoelectric conversion device (Figure 1) and further discloses an electrolyte solution/wet chemistry between the flexible substrate and counter electrode generates a photoelectromotive force (col.3; lines: 57-68). Kawakami further teaches that the electrolyte solution preferably contains at least one electrolyte selected from a group consisting of acids, bases, and salts of metals having standard electrode potentials (col. 4; lines:55-60). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate wet chemistry/an electrolyte solution as taught by Kawakami to the method of fabricating the photoelectric conversion device of Meinhardt in order to generate a photoelectromotive force within the device.

9. Claim 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meinhardt et al. "Optoelectronic Device made from Multilayer and Molecularly Doped Organic Layers," SPIE Conference on Organic Photonic Materials and Devices Vol. 3623, January 1999, pp. 46-57) as applied to claim 14 above, and in further view of Li et al. (2003/0188776).

As to claims 18 and 20, Meinhardt et al. discloses the fabrication method of a photoelectric conversion device as claimed in claim 14, but fails to disclose wherein the

metal oxide film is formed on a transparent plastic substrate and the semiconductor electrode is formed at a temperature not lower than 100°C and not higher than 140°C.

Li et al. discloses a photovoltaic device (Figure 1) and further discloses the photovoltaic comprising of a plastic substrate to give it a flexible characteristic (paragraph 158) coated with a semiconductor electrode/ITO (paragraph 138 & 140) that is sputter coated and then heat treated to 120°C to complete the processing of the device and measure the current/voltage characteristics of the device (paragraph 140). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a heat treatment of the ITO onto the plastic flexible substrate as taught by Li et al. to the method fabrication of the photoelectric conversion device of Meinhardt in order to complete the processing of the device and measure the current/voltage characteristics of the device.

10. Claims 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meinhardt et al. "Optoelectronic Device made from Multilayer and Molecularly Doped Organic Layers," SPIE Conference on Organic Photonic Materials and Devices Vol. 3623, January 1999, pp. 46-57) in view of Takahashi et al. (US 6,261,684).

With respect to claims 22 and 24, Meinhardt et al. discloses a photoelectric conversion device/electronic apparatus (paragraph 2, page 47) comprising a electrode/ITO formed on a metal oxide film/organic layer 1 (TiO-Pc layer) as shown in Figure 2 (paragraph 5, page 48), wherein an intermediate film comprising a compound selected from polythiophene / PEDOT defined by the following Formula 1 as well as polystyrenesulfonic acid defined by the following Formula 2, on the metal oxide film/

TiO-Pc and forming the metal film/Al on the intermediate film/PEDOT-PSS (section 3.1 (b) on page 50) as shown in Figure 1. However, Meinhardt does not disclose fine particles.

Takahashi et al. discloses the semiconductor device to control the effects of solar radiation and further discloses the use of ITO powder composed of the average particle size of 100 nm or less (col. 3; lines:35-46). Takahashi further teaches that the transparency and uniformity of the infrared ray blocking layer depends on the average particle size of the ITO powder such that a clear view and electromagnetic wave transmission are obtained (col. 3; lines: 35-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate nano-sized ITO particles as taught by Takahashi et al. to the fabrication method of a photoelectric conversion device of Meinhardt in order to receive a clear view and electromagnetic wave transmission.

With respect to claim 23, Meinhardt et al. discloses a manufacturing method of an electronic apparatus/photoelectric conversion device(paragraph 2, page 47) comprising of a comprising a semiconductor electrode/ITO formed on a metal oxide film/organic layer 1 (TiO-Pc layer) as shown in Figure 2 (paragraph 5, page 48), wherein the method includes steps of forming an intermediate film comprising a compound selected from polythiophene / PEDOT defined by the following Formula 1 as well as polystyrenesulfonic acid defined by the following Formula 2, on the metal oxide film/ TiO-Pc and forming the metal film/Al on the intermediate film/PEDOT-PSS (section 3.1

(b) on page 50) as shown in Figure 1. However, Meinhardt does not disclose fine particles.

Takahashi et al. discloses the semiconductor device to control the effects of solar radiation and further discloses the use of ITO powder composed of the average particle size of 100 nm or less (col. 3; lines:35-46). Takahashi further teaches that the transparency and uniformity of the infrared ray blocking layer depends on the average particle size of the ITO powder such that a clear view and electromagnetic wave transmission are obtained (col. 3; lines: 35-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate nano-sized ITO particles as taught by Takahashi et al. to the fabrication method of a photoelectric conversion device of Meinhardt in order to receive a clear view and electromagnetic wave transmission.

With respect to claim 25 and 26, Meinhardt et al. discloses a semiconductor fine particle layer formation method and a manufacturing method of an electronic apparatus/photoelectric conversion device(paragraph 2, page 47) comprising of a comprising a semiconductor electrode/ITO formed on a metal oxide film/organic layer 1 (TiO-Pc layer) as shown in Figure 2 (paragraph 5, page 48), wherein the method includes steps of forming an intermediate film comprising a compound selected from polythiophene / PEDOT defined by the following Formula 1 as well as polystyrenesulfonic acid defined by the following Formula 2, on the metal oxide film/ TiO-Pc and forming the metal film/Al on the intermediate film/PEDOT-PSS (section 3.1

(b) on page 50) as shown in Figure 1. However, Meinhardt does not disclose fine particles.

Takahashi et al. discloses the semiconductor device to control the effects of solar radiation and further discloses the use of ITO powder composed of the average particle size of 100 nm or less (col. 3; lines:35-46). Takahashi further teaches that the transparency and uniformity of the infrared ray blocking layer depends on the average particle size of the ITO powder such that a clear view and electromagnetic wave transmission are obtained (col. 3; lines: 35-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate nano-sized ITO particles as taught by Takahashi et al. to the fabrication method of a photoelectric conversion device of Meinhardt in order to receive a clear view and electromagnetic wave transmission.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ASHA HALL whose telephone number is (571)272-9812. The examiner can normally be reached on Monday-Thursday 8:30-7:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJH

ALEXA D. NECKEL
SUPERVISORY PATENT EXAMINER